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| **Unit Title:** Ratios and Proportional Relationships | **Pacing (Duration of Unit):** 5 weeks |

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| **Desired Results** |

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| **Transfer Goals (**Priority practice standards in **bold)** |
| *Students will be able to independently use their learning to:*   1. **Make sense of problems and persevere in solving them.** 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. **Model with mathematics.** 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. **Look for and express regularity in repeated reasoning.** |
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| **Established Goals (2011 MA Curriculum Frameworks Standards Incorporating the Common Core State Standards)** |

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| **Prerequisite Standards:**   * 6.RP.1: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”* * 6.RP.2: Understand the concept of a unit rate ***a***/***b*** associated with a ratio *a*:*b* with *b* ≠ 0, and use rate language in the context of a ratio relationship. *For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is ¾ cup of flour for each cup of sugar.” “We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger.”* * 6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.   + 6.RP.3a: Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.   + 6.RP.3b: Solve unit rate problems, including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then, at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*   + 6.RP.3c: Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means **30**/**100** times the quantity); solve problems involving finding the whole, given a part and the percent.   + 6.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. |  |
| **Standards (**Priority Standards in **bold):**   * 7.RP.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. * **7.RP.2: Recognize and represent proportional relationships between quantities.**   + 7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in   + a table, or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.   + 7.RP.2b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.   + 7.RP.2c: Represent proportional relationships by equations. * **7.RP.3: Use proportional relationships to solve multi-step ratio and percent problems.** * **7.G.1: Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.** |

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| **Meaning (\*Mostly assessed through Performance Tasks/Assessments)** |

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| **Big Ideas:** (Statements and concepts written in teacher friendly language which reflect the important [but not obvious] generalizations we want students to be able to arrive at. These are used by the teacher to focus daily instruction.)   * Recognize and model a proportional relationship between two quantities in different representations like table, graph equation diagram and verbal description * Identify the constant of proportionality ( unit rate) in all representations * Application of proportional relationships in multistep ratio and percent problems * Scale drawings and models can be represented by a proportional relationship | **Essential Questions:** (Questions which frame ongoing and important inquires about the big ideas. They are written for students and used in daily instruction to help engage students in meaningful thinking.)   * How does the constant of proportionality help in extending and analyzing real world situations? * When do we use ratios and proportions in our daily life? |

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| **Acquisition (\*Mostly assessed through traditional summative assessments)** | |
| **Knowledge:** Key basic concepts, facts, and key terms (written in phrases) students should be able to recall independently.  *Students will know …*   * Ratios and proportions * Representations of proportional relationships (graph, table, equations, and words) * Constant of proportionality * Scale factor   **Key Academic Vocabulary:**   * Ratio * Proportion * Rate * Unit Rate * Constant of proportionality * Scale factor | **Skills:** The discrete skills and process students should be able to use independently.  *Students will be skilled at:*   * Finding the missing value in a proportion * Writing a ratio as part-to-part and part-to-whole * Finding a unit rate and using it to solve proportional relationships * Recognizing unit rates as constant of proportionality * Determining if two quantities are proportional * Rewriting and solving proportions as equations using the cross products * Represent proportional relationships between two quantities in tables, * graphs diagrams and verbal descriptions * Applying proportional reasoning to solve problems involving scale * drawings * Write and solve proportions to represent real life multi-step problems |

**Resource Suggestions:**

from the Math Assessment Project: [www.map.mathshell.org](http://www.map.mathshell.org)

7.RP (Ratio and Proportion) [Developing a Sense of Scale](http://map.mathshell.org/materials/lessons.php?taskid=456&subpage=problem)